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Decreases in the waterbird populations at Lake Turkana, Kenya

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Lake Turkana has long been considered one of the most important wetlands in East Africa, particularly for migrant species (e.g., Fry *et al.* 1972). In 1980, Pearson & Stevenson reckoned its shores to hold more wintering waders than all the other Kenyan Rift Valley lakes. Yet, until recent times, the lake received limited attention from ornithologists, the main causes for this being its enormous size and harsh climate. Renewed interest has resulted in a number of censuses and other research work being carried out in the area since 1986, producing the first numeric estimates of overall waterbird numbers.

From December to March the lake is now considered to hold a population of about 200 000 birds—at least half of them are waders (Schekkerman & van Wetten 1987, Pearson *et al.* 1992a, b, Fasola *et al.* 1993a). These numbers decrease by almost 80 per cent in July, when the Palaearctic migrants leave (Fasola *et al.* in press). Some 25 waterbird species could be represented at Turkana by more that 1 per cent of their East African populations, and thus meet one of the Ramsar Convention's criteria for identifying internationally important wetlands (Fasola *et al.* 1993a, Pearson *et al.* 1992b).

Although the order of magnitude of the lake's avifauna is now quite well known, very little information is available on its fluctuations in the long term. Comparisons between years are difficult because the stretches of shore chosen for different surveys were largely non-coincident and because of the differences in census techniques (i.e., ground or aerial).

In this paper we present the results of a census carried out in February and March 1993 along a 165-km-long section of lake shore previously surveyed in 1987 by Schekkerman and van Wetten. The two data sets are compared, and with those of a 1992 census (Fasola *et al.* 1992a).

Survey area and methods

The survey area was described in detail by Hopson (1982) and by Schekkerman & van Wetten (1987). Figure 1 shows the area where the censuses were carried out and the localities cited in the text.

The severe drought that had struck the region for over three years suddenly came to an end at the beginning of 1993. Rain was met with on 25 February, 8 and 15 March. Local people told us that more had fallen before our arrival. The good rains were probably one of the reasons for the very low numbers of birds recorded in the Loyengalani–El Molo area, as here the shores were covered by large amounts of debris brought down by temporary rivers.

The census was done between 22 February and 15 March 1993 from Loyengalani (2°43N, 36°41E) to Allia Bay (3°45N, 36°17E). The counting technique was the same as adopted by Schekkerman and van Wetten (1987). The difference of about 15 days between the dates of the two surveys had no negative influence on the comparisons because no migration-related changes or movements in the avifauna were noticed during the fieldwork. Nomenclature follows Howard & Moore (1991).

Results

The results of the counts and the differences between 1993 and 1987 are presented in Table 1. The avifauna of the lake seems to have decreased, both in overall numbers and in diversity. A total of 29 810 individuals of 73 species was recorded during our stay, that is, respectively 29 330 and ten fewer species than in the previous survey. Most species had decreased markedly, while only a few had increased; these were mainly resident or intra-African migrants, such as Spur-winged Plover *Vanellus spinosus* (resident), Common Pratincole *Glareola pratincola* (partial resident), Grey-headed Gull *Larus cirrocephalus* (resident) and Saunders' Little Tern *Sterna saundersi*, whose status is not clear but is believed to have an isolated resident population at Turkana (Lewis & Pomeroy 1989). Figure 2 shows variations in different taxa during the six-year period: Pelecaniformes lowered by 53 per cent, Ciconiiformes by 48 per cent, Scolopacidae by 58 per cent, and Anatidae by 83 per cent: in the last, the decline of the Palaearctic species was almost 99 per cent, as only 27 individuals of Palaearctic origin were observed against 2208 in 1987; Charadriidae exhibited a relatively limited decline of about 17 per cent. Laridae decreased by a small amount (6 per cent), but here Palaearctic species showed a strong reduction (45 per cent) while Afrotropical ones increased substantially (32 per cent).

The numeric decrease observed in 1993 was particularly strong where the highest populations were located, that is, the Loyengalani–El Molo area and Allia Bay, where long stretches of muddy shore are found. The long rocky and sandy sections, from Sandy Bay to Moiti, lost comparatively fewer birds (Figure 3). Maximum densities of 400–450 birds/km were recorded in muddy habitats, against those as high as 1237 birds km^{-1} in 1987.

On the whole, in 1993, the lake failed to provide observations of species rarely recorded inland, in contrast to previous surveys. The only somewhat unusual record was of a Red-necked Phalarope *Phalaropus lobatus* at El Molo Bay on 28 February. This is a mainly marine species that occasionally winters inland (Dowsett 1980).

Comparison with the 1992 census (Fasola *et al.* 1993a) is diffificult as these estimates were obtained by an aerial census; only a relatively short stretch of shore, 56 km long, was counted from the ground (Biddau & Borghesio unpublished data) and was entirely comprised within the present survey. Referring to it (Figure 4), decreases are again noticeable in most taxa, the largest being those of Scolopacidae (down 59 per cent) and Anatidae (down 82 per cent). Laridae and Pelecaniformes increased, although very slightly (up 5 per cent and 8 per cent, respectively). An overall total of 9929 birds of 57 species was recorded in 1993 against 18 993 of 63 species in 1992.

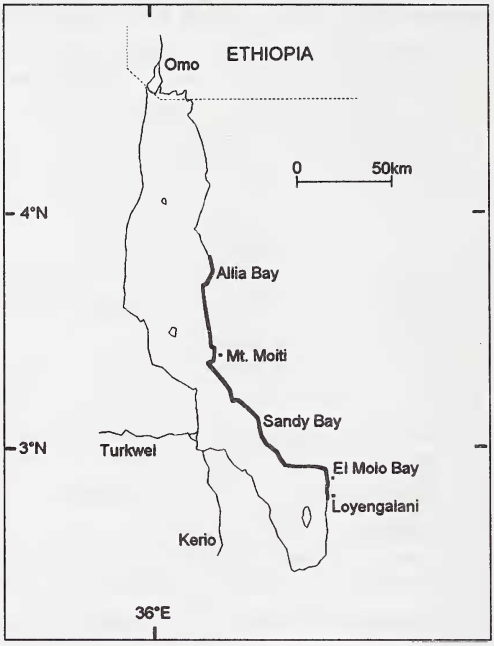

Figure 1. *Map of Lake Turkana showing the localities mentioned in the text. The bold line indicates the census area*

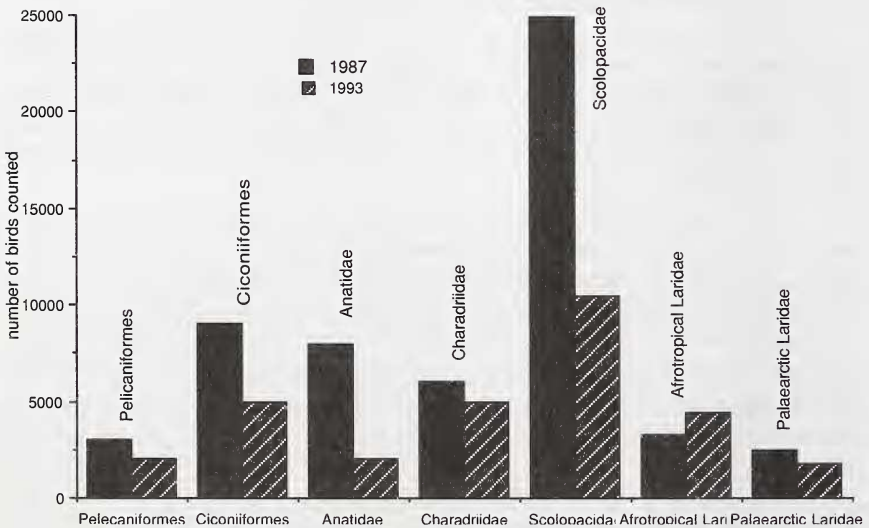

Figure 2. *Numbers of birds counted at Lake Turkana in 1987 and 1993*

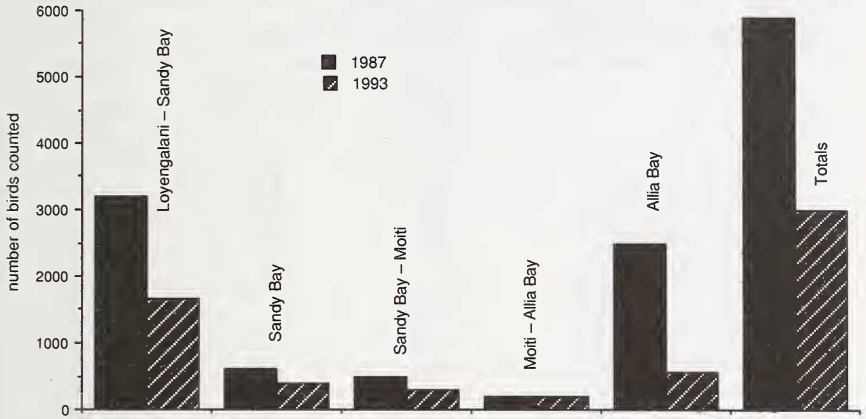

Figure 3. *Numbers of water birds counted at Lake Turkana in 1987 and 1993*

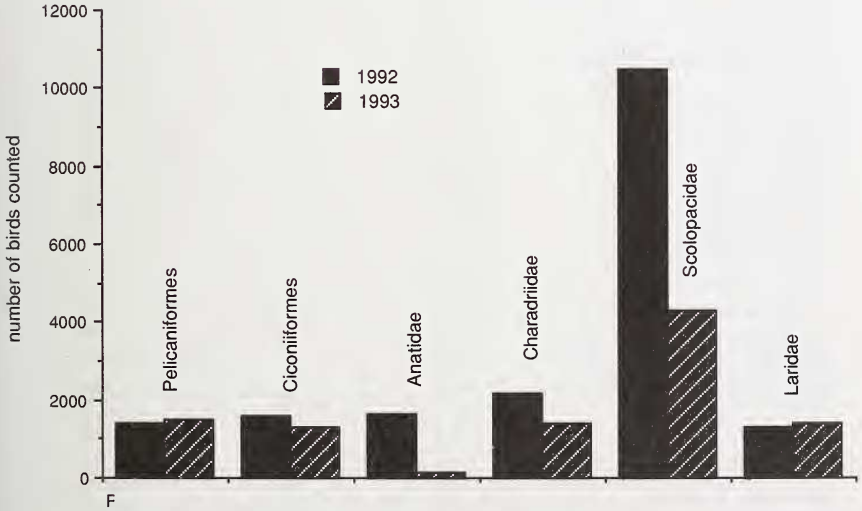

Figure 4. *Waterbirds counted along 56-km of shore at Lake Turkana in 1992 and 1993*

Table 1. *Birds counted at Lake Turkana in February–March 1993, and differences between 1993 and 1987 counts. R = Resident, P = partial migrant, I = migrant*

Species	1993 counts	Difference: 1993–1987	Status
Tachybaptus ruficollis	83	-73	R
Pelecanus onocrotalus	196	-369	P
Pelecanus rufescens	172	-766	P
Phalacrocorax carbo	387	-558	R
Phalacrocorax africanus	879	-142	R
Ardea cinerea	158	-150	R
Ardea melanocephala	1	-4	R
Ardea goliath	20	-22	R
Ardea purpurea	6	5	P
Egretta alba	45	-290	P
Egretta ardesiaca	11	0	P
Egretta garzetta	358	-81	P
Egretta g. schistacea	3	2	P
Bubulcus ibis	145	-36	R
Ardeola ralloides	20	-45	P
Butorides striatus	2	0	R
Nycticorax nycticorax	25	3	P
Mycteria ibis	109	-288	R
Ciconia abdimii	2	2	I
Ciconia ciconia	2	2	I
Leptoptilos crumeniferus	6	-8	R
Threskiornis aethiopica	142	14	R
Plegadis falcinellus	96	-268	P
Platalea alba	171	-410	R
Phoenicopterus ruber	553	-1192	P
Phoeniconaias minor	2929	-1703	R
Dendrocygna bicolor	8	-2316	P
Dendrocygna viduata	181	-1616	P
Alopochen aegyptiacus	1084	-657	R
Plectropterus gambensis	111	111	P
Sarkidiornis melanotos	4	-12	P
Anas penelope	8	-498	I
Anas acuta	16	-589	I
Anas hottentota	18	-49	P
Anas querquedula	2	-174	I
Anas clypeata	1	-919	I
Netta erythrophthalma	1	-60	P

Species	1993 counts	Difference: 1993–1987	Status
Pandion haliaetus	30	-25	I
Haliaeetus vocifer	18	-1	R
Fulica cristata	21	2	P
Rostratula benghalensis	2	0	R
Himantopus himantopus	165	-788	P
Recurvirostra avosetta	145	68	I
Burhinus senegalensis	161	-137	R
Glareola pratincola	698	370	P
Vanellus spinosus	1996	719	R
Charadrius hiaticula	1633	-264	I
Charadrius pecuarius	847	-899	R
Charadrius tricollaris	1	-6	R
Charadrius asiaticus	171	-399	I
Limosa limosa	305	-4279	I
Numenius arquata	4	-11	I
Tringa totanus	4	-1	I
Tringa stagnatilis	454	-294	I
Tringa nebularia	456	-85	I
Tringa glareola	93	-211	I
Xenus cinereus	25	24	I
Actitis hypoleucus	350	-243	I
Arenaria interpres	35	-19	I
Phalaropus lobatus	1	1	I
Calidris minuta	8012	-8731	I
Calidris ferruginea	476	-309	I
Philomachus pugnax	280	-233	I
Larus fuscus	217	-21	I
Larus cirrocephalus	1930	147	R
Larus ridibundus	271	-268	I
Chlidonias hybrida	37	-574	I
Chlidonias leucoptera	914	-218	I
Gelochelidon nilotica	55	-121	I
Hydroprogne caspia	33	-13	I
Sterna saundersi	1430	1115	unclear
Rynchops flavirostis	559	-317	R
Ceryle rudis	26	19	R
Total	29810	-29330	

Discussion

The data collected at Lake Turkana are well in accordance with the results of the 1993 winter census in the southern Kenyan Rift Valley lakes (Bennun 1993), and all of them show substantial decreases in the Kenyan waterbird populations. As similar downward trends were not generally reported elsewhere in Africa (Taylor 1993), the decreases were probably caused by local environmental changes. The heavy rains that fell on the lake, and on all Kenya, in the first part of the year had surely some negative effects on waterbirds in 1993, but Fasola *et al.* (1993a) reported that at Turkana by January 1992, when the region was under a severe drought, the numbers of some taxa (mainly Pelecaniformes, Ciconiiformes and Anatidae) were already lower than previously. Only variations in Scolopacidae and Charadriidae can therefore be related to the 1993 weather. The decline of Turkana's avifauna can thus be traced over a period of at least two years, and it appears to have affected the larger, mainly fish-eating, species before the waders. The causes for it are not clear, but possible candidates are the increase of fishing activities and the lowering of the lake level, which in turn could have modified the water chemistry and reduced important bird habitats, both in extent and in productivity.

A few species, all of them resident or partly resident, despite general trends, showed substantial increase in numbers. It seems that they profited from the reduced competition by Palaearctic immigrants. This is in partial contradiction with previous studies (Duffy *et al.* 1981, Fasola *et al.* 1993b), that found little evidence of competition between tropical and immigrant waterbirds on the wintering grounds.

More research is needed at Turkana in future years in order to evaluate waterbird populations and the factors contributing to their variation more accurately. It is to be hoped that the disturbingly low numbers recorded in 1993 will soon regain normal levels. However, even if a 50 per cent decrease is assumed, the lake could still hold about 100 000 waterbirds during winter. Moreover, the 165 km of eastern shore censused in 1993, which makes up no more than 25 per cent of the lake, held well over 1 per cent of the estimated total for the Arabian–East African flyway (Perennou 1992) for Caspian Plover *Charadrius asiaticus*, Common Sandpiper *Actitis hypoleucus*, Marsh Sandpiper *Tringa stagnatilis*, Greenshank *Tringa nebularia* and Little Stint *Calidris minuta*.

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References

Bennun, L.A. 1993. Waterbirds in the southern Kenyan Rift Valley, January 1993. *Centre for Biodiversity research reports: Ornithology* No. 13.

Dowsett, R.S. 1980. The migration of coastal waders from the Palearctic across Africa. *Gerfaut* 70: 3–35.

Duffy, D.C., Atkins N. & Schneider, D.C. 1981. Do shorebirds compete on their wintering grounds? *Auk* 98: 215–229.

Fasola, M., Biddau, L., Borghesio, L., Baccetti, N. & Spina, F. 1993a. Water bird populations at Lake Turkana, February 1992. *Proceedings of the VIII Pan-African Ornithological Congress*: 529–532.

Fasola, M., Biddau, L. & Borghesio, L. 1993b. Habitat preferences of resident and palaearctic water birds at Lake Turkana. *Proceedings of the VIII Pan-African Ornithological Congress*: 539–545.

Fasola, M., Biddau, L., Borghesio, L., Saino, N. & Bennun, L. in press. Ripartizione delle risorse trofifiche nella comunita di uccell i acquatici residenti e migratori del Lago Turkana, Kenya. *Atti VII Convegno Italiano di Ornitologia.*

Fry, C.H., Britton, P.L. & Horne J.F.M. 1972. Lake Rudolf and the Palaearctic exodus from East Africa. *Ibis* 166: 44–51.

Hopson, A.J., (ed), 1982. *Lake Turkana: a report of the findings of the Lake Turkana project 1972–75.* Vol. I-VI. London: Overseas Development Administration.

Howard, R. & Moore, A. 1991. *A complete checklist of the birds of the world.* Second edition. London: Academic Press.

Lewis, A. & Pomeroy, D., 1989. *A bird atlas of Kenya.* Rotterdam: Balkema.

Pearson, D.J. & Stevenson, T. 1980. A survey of wintering Palaearctic waders in the southern part of the Kenyan rift valley. *Scopus* 4: 59–63.

Pearson, D.J., Coverdale, M. A. C. & Archer, A.L. 1992a. Recent surveys of wintering waders at Lake Turkana, Kenya with details of 1989 counts on the northeast shore. *Scopus* 16: 29–33

Pearson, D.J., Stevenson, T., Coverdale, M.A.C., Schekkerman, H. & van Wetten, J.C.J. 1992b. Estimates of Palearctic wader and duck numbers wintering in the Kenyan Rift Valley. *Proceedings of the VII Pan-African Ornithological Congress*: 23–35.

Perennou, C. 1992. *African Waterfowl Census 1992—Les Denombrements Internationaux d'oiseaux d'eau en Afrique 1992.* Slimbridge: IWRB.

Schekkerman, H. & van Wetten, J.C.J. 1987. *An ornithological survey of Lake Turkana, Kenya.* WIWO-report No. 17.

Taylor, V. 1993. *African Waterfowl Census 1993. Les Denombrements Internationaus d'oiseaux d'eau en Afrique, 1993.* Slimbridge: IWRB

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